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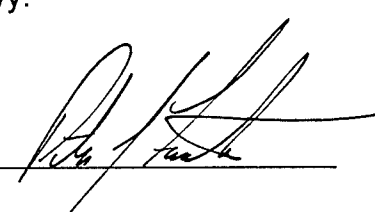
SEA MINES AT THE OPERATIONAL LEVEL OF WAR

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

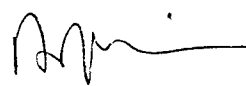
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ABSTRACT

Sea mines represent a significant challenge to the operational commander both in operational planning and execution. Mining affects all levels of warfare: strategic; operational; and tactical. Through historical example, the impact of mines at the Operational level of war can be readily demonstrated. Analyzing lessons learned shows how mines can affect operational maneuver, operational tempo, surprise, and security. Additionally, since mines are inexpensive, plentiful, and can be easily placed, planning for mine countermeasure operations is a requirement for every operation, large or small. Using historical examples for a framework, a conceptual model to evaluate the need for mine countermeasures planning can be created, allowing for advance planning and for tailoring operations to better meet the threat.

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Sea Mines at the Operational Level of War

The damage caused by mines during the Persian Gulf War once again dredged up numerous studies on Mine Warfare and Mine Countermeasures (MCM). New articles were written rehashing lessons the Navy relearns with every generation of warfighters. The requirements for new MCM technology and effective use of existing assets were preached from every pulpit in an attempt to generate interest and improve funding for this form of warfare. All of these were, of course, worthy goals, but were of little help to the operational commander faced with using existing technology to counter mines in the theater of operations.

Failure to adequately recognize and plan for the mine threat has had a serious operational level impact on military commanders throughout recent history. Through historical examples, the influence of sea mines on the operational level of war can be readily demonstrated. Using these lessons as a framework, a conceptual model evaluating the need for MCM planning can be created, allowing the operational commander a means for evaluating the problem and for adjusting operations to better meet the threat.

Mine Warfare Psychology. In order to better understand the impact of sea mines at all levels of warfare, the psychology of mine warfare, and why mines “work”, will be addressed. Mines are a psychological as well as physical threat. Mines can be used to deny naval and amphibious forces access to a maritime region. The use of mines establishes control of the sea, limiting or slowing an invading force’s entry into an area. Thus, mines can arguably be used to develop

sea control and limited sea superiority. In this context, "sea superiority" is defined as preventing an adversary (from the enemy's perspective) from fulfilling operational requirements and goals in a maritime area of operations.

Even the threat of mines is often enough to change a commander's plans.

"Minefields can be used most effectively to attain the primary goal of controlling enemy forces afloat. If a minefield forces enemy ships to delay, divert, or forgo the transit of water suspected of being mined, it has achieved control. Minefields achieve that goal principally through the enemy's *perception* of the threat the mines pose to the enemy's ships."¹

--"The Psychology of Mine Warfare"

Sea control, or even sea superiority, can be attained by mining since "control results from human perceptions of potential damage"². A few mines can limit access to an area simply by adding an unknown factor. Gauging the extent of the mine threat may be difficult since, once the first ship is struck, the size of the minefield cannot normally be determined unless sweeping operations are conducted; so a few mines may be as effective as many. A perfect historical example of how six mines changed a commander's course of action, and won a battle "passively,"³ is the American mining of Haiphong harbor during World War II. The mines were laid as part of Operation Starvation, the goal of which was to cut Japan off from the raw materials required for the war effort.

"Haiphong, 1943: In October, 1943, a single U.S. B-24 bomber dropped three mines in Haiphong harbor. One of them sank a Japanese freighter. The next month, another B-24 planted three more mines, which sank another Japanese freighter. Then a Japanese convoy of ten ships refused to enter Haiphong harbor for fear of mines. After loitering outside the harbor for a few

¹ William L. Greer and James Bartholomew, "The Psychology of Mine Warfare," U.S. Naval Institute Proceedings, February 1986, p.60.

² Ibid, p. 58.

³ Gregory K. Hartman and Scott C. Truver, Weapons That Wait: Mine Warfare in the U.S. Navy. (Annapolis: U.S. Naval Institute, 1991), p. 233.

hours, the convoy headed for Hainan Island. On the way it was detected and attacked, and six of its ships were sunk."⁴

--*"The Psychology of Mines Warfare"*

This example shows how the psychological threat from a handful of mines forced the commander to forgo a safer course of action (crossing the mine field of 4 mines), instead taking a higher risk and exposing himself more readily to enemy forces (sailing in an area of higher enemy activity).

Mines as Force Multipliers. Mines allow even a third world nation to create a navy that can maintain sea superiority for a given time period. Mines are cheap and easily available on the world arms market. The mines that did millions of dollars in damage to the frigate USS Samuel B. Roberts and the cruiser USS Princeton cost approximately \$1,500 and \$3,000 respectively.⁵ Just as the mines themselves are inexpensive, so are the craft that can lay them. The Koreans used small boats to lay the mine fields that so amply delayed the landing at Wonsan (discussed later). Almost anything that floats can lay mines in coastal waters; thus allowing a small nation power at sea over a large well equipped navy. Combining the minimal cost with the ease of delivery, mines are a very real force multiplier for a poor nation.⁶ Admiral Smith, the amphibious force commander at Wonsan, Korea, summed up the ease with which mines can be employed and the influence this can have on a modern military force.

⁴ William L. Greer and James Bartholomew, "The Psychology of Mine Warfare," U.S. Naval Institute Proceedings, February 1986, p. 58.

⁵ J. M. Martin, "We Still Haven't Learned," U.S. Naval Institute Proceedings, July 1986, p.65.

⁶ Carl White, "Move and Countermove: Belated Recognition for Naval Mine Warfare and Mine Countermeasures Requirements," Seapower, June 1985, p. 27.

"We have lost control of the seas to a nation without a Navy, using pre-World War I weapons, laid by vessels that were utilized at the time of the birth of Christ."⁷--Admiral Allan E. Smith

Mines at all Levels of Warfare. Mines can have a significant impact on war at all levels: strategic; operational; and tactical. The intended objective for which the mines were laid is the determining factor in deciding whether the mining may be described as strategic, operational, or tactical. Even though a ship striking a mine may seem very tactical to the Commanding Officer, it is the objective that the minefield serves in the overall warfighting scheme that determines which level of war is applicable. Strategic mining would be defined as mines laid to impact a nation's ability to effectively project power and wage war. Operational mining would have an impact on the subordinate campaigns and major operations in a theater of operations. The operational commander's plans and decisions would be shaped by the threat of mining. The intent of this mining would be to disrupt and delay major operations and subordinate campaigns within the theater. Finally, tactical mining would be limited in scope to individual battles or engagements. Though the purpose here is to only deal with the operational level of war, the others will be briefly addressed to show a comparison.

Strategic Mining. Strategically, mines can be used both militarily and economically. During World War II the Japanese depended on imports for 20 percent of their food, 90 percent of their oil, 88 percent of all iron, and 24 percent of

⁷ Admiral Allan E. Smith, as quoted in Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p. 76.

all coal.⁸ In Operation Starvation, the United States used aerial mining to close off the shipping routes to Japan, crippling the Japanese war effort. Over 25,000 mines were laid, resulting in the confirmed sinking or damage of 670 ships.⁹ One interesting note on the persistence of mines is that in 1971, after twenty-six years of mine sweeping operations, a United States Navy estimate showed that there were still 2,000, of the original 25,000, mines left to be cleared.¹⁰ Operation Starvation is a clear example of both a strategic military and economic (although the economic was ultimately aimed at a military goal) purpose for mining.

Tactical Mining. It is often difficult to distinguish a purely tactical reason for mining an area. Instead of engaging the Iranian fleet during Operation Praying Mantis (1988), the United States might have destroyed an equivalent number of Iranian ships by mining a harbor. This would have been an example of a tactical application for mining.

Operational Mining. Using historical examples, the impact mining has had at the operational level of war will be examined. In each case the operational commander's decisions were shaped by mines in the area of operations. The objective of the mining in these cases was to manipulate key principles of war to favor the defenders and thwart the attackers on an operational level.

⁸ Arnold S. Lott, Most Dangerous Sea: a History of Mine Warfare and an Account of U.S. Navy Mine Warfare Operations in World War II and Korea. (Annapolis, MD: U.S. Naval Institute, 1959), p.207.

⁹ Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p.63.

¹⁰ Ibid, p. 64.

The Persian Gulf War. Naval Doctrine Publication 1 emphasizes maneuver:

"Mobility is a key to decisive naval operations. The ability to strike vulnerable targets, or to threaten amphibious assault at multiple locations along an extended coastline, is a significant tactical and operational advantage."¹¹ Mobility is the key element in operational maneuver. Mines are planted to limit the options available in maneuver warfare. Maneuver warfare was impacted in the maritime operating area of the Persian Gulf War as surely as if a mountain range had miraculously erupted in front of the Coalition ground forces on land. The extensive mine fields off the Kuwaiti coastline were possibly the largest contributing factor to the abandonment of an amphibious assault and the removal of this maneuver option. The Department of Defense Final Report to Congress does not mince words on the effectiveness of the Iraqi mining operations.

"The Iraqi mine threat affected almost all naval operations during the conduct of the Persian Gulf Conflict. The Coalition's ability to conduct amphibious operations and NGFS {Naval Gun Fire Support} was constrained by the minefields in the northern Persian Gulf. The mine threat also affected naval air strike operations because it forced the carrier battle groups in the Persian Gulf to operate at greater ranges from targets in Iraq."¹²

--Conduct of the Persian Gulf War, Final Report to Congress

Mines threatened force security and thereby influenced operational maneuver. The need to maximize force security limited the operational commander's options for maneuver. Had the Saudi Arabian government refused to let the Coalition forces stage their assault out of Saudi territory, or had the Saudi's

¹¹ U.S. Department of the Navy, Naval Doctrine Publication 1, Naval Warfare (Washington: U.S. Government Printing Office, 28 March 1994). p.13.

¹² U.S. Department of Defense, Conduct of the Persian Gulf War, Final Report to Congress (Washington, April 1992), P. 306. UNCLASSIFIED

removed their permission following an Israeli retaliatory strike against Iraqi SCUD missiles aimed at Israeli cities, immediate MCM operations would have been required to regain the maneuver options lost to mining. The time needed to conduct MCM operations would have slowed operational tempo and possibly limited surprise by telegraphing the location of the amphibious assault area.

The Falkland Islands. The British were faced with a similar situation during the Falkland Islands War with Argentina. The British Task Force Commander, Admiral Sir John Woodward, knew that if the Argentines wanted to prevent an amphibious landing, they could simply mine the approaches to the landing areas. British submarines had already observed mine laying operations in the vicinity of Port Stanley, which was the most obvious place for a British assault. In retrospect, Admiral Woodward wrote that if the Argentines had mined Falkland Sound, and by default mined the approaches to the eventual landing site at San Carlos Bay, the British, lacking minesweepers, could have lost a "half dozen ships and a couple of thousand men four miles short of the landing area." Given his need to determine the extent of the threat, the British commander sent one of his frigates to transit the approaches to the proposed amphibious area and determine if mines were present.¹³ Every ship can minehunt, once.

The mines off Port Stanley limited the operational commander's options for maneuver, forcing the examination of other amphibious assault sites. Fortuitously for the British, San Carlos Bay was a viable option. Additionally, had the Argentines

¹³ Sir John "Sandy" Woodward with Patrick Robinson, One Hundred Days. The Memoirs of the Falklands Battle Group Commander. (Annapolis, MD: U.S. Naval Institute Press, 1992) pp. 201-203.

mined Falkland Sound, a lack of MCM capabilities would have severely impacted the security of the amphibious landing.

The Korean War. The best example of how mining influenced an operational theater is the Korean War. Three key ports were mined by the North Koreans with Soviet assistance: Inchon, Wonsan, and Chinnampo. All three ports had similarities in that a limited time frame was provided to plan and execute the mine clearance operations.

Taken chronologically, Inchon was the first landing in the Korean War where mines were present. Inchon led to a false sense of operational security since the mines placed there were "unsophisticated and relatively few; they were countered without real difficulty."¹⁴ Since the landing force was able to pass over the mines at high tide and suffer no casualties, the next operation, Wonsan, was judged accordingly, and insufficient emphasis was placed on the potential delays caused by well placed mines.¹⁵

Given only three weeks to plan the Wonsan landing, and lacking intelligence on the number and placement of the minefields in the approaches to Wonsan, the U.S. Navy, along with South Korean and Japanese minesweepers, began operations to clear the approaches to the landing sites. Operations began on 9 October and continued for nearly a week until sufficient mines had been cleared to allow for an amphibious landing. During the week four MCM craft were lost to

¹⁴ Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p. 73.

¹⁵ Ibid, p.73.

mines. By the time the troops came ashore, the region was already in the control of Republic of Korea(ROK) troops, who had swept north by land. Fifty thousand American troops, from a 250 ship armada, were delayed by three thousand mines and the slow tedious nature of mine sweeping operations.¹⁶ The commander of the amphibious task force, Admiral Allan E. "Hoke" Smith wrote in his final report on Wonsan:

"The Navy able to sink an enemy fleet, to defeat aircraft and submarines, to do precision bombing, rocket attack, met a massive 3,000 mine field laid off Wonsan by Soviet naval experts...The strongest Navy in the world had to remain in the sea of Japan while a few minesweepers struggled to clear Wonsan."¹⁷ --Admiral Allan E. Smith

To add insult to injury, Bob Hope and the USO were waiting to give the arriving troops a show.

Having learned from Wonsan, massive efforts were undertaken to develop intelligence on the extent of mining in the next port to be invaded, Chinnampo. Chinnampo was essential to the resupply of Allied forces sweeping northward and had to be cleared to allow sea based logistics to enter the area. To examine the minefields before MCM operations commenced, the Allies used fixed wing aircraft and helicopters to determine the extent and placement of the mines. Intelligence was gathered from captured Korean personnel on the types of mines and the patterns of the minefields. Unlike the ad hoc MCM force at Wonsan, the Allies massed a large minesweeping force of small craft, minesweepers, and support

¹⁶ Ibid, pp. 74-79.

¹⁷ Admiral Allan E. Smith, as quoted in Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p. 79.

ships. Thus, the Allies were able to clear the channels needed to allow resupply from the sea in a few days, without the loss of MCM craft or personnel.

Inchon demonstrates that an operational commander may become complacent if mines are not a threat in an early operation. Wonsan is a ready example of how a threat to force security from mines can slow operational tempo and limit the surprise potential of an invading force. Finally, Chinnampo demonstrates that proper planning and emphasis on MCM operations can lead to success without loss of life or assets. Conversely, a failure at Chinnampo could have easily impacted the operational maneuver options of advancing ground forces by limiting logistics to a more land based operation.

As evidenced by the preceding historical studies, mines in the maritime operating area and the amphibious operating area can cause long delays in getting friendly troops to the fight. Mines cause the operational tempo to swing to the enemy's advantage by forcing mine sweeping operations to precede the actual invasion force. The requirement to conduct MCM operations can limit surprise, potentially allowing the enemy to reinforce coastal defenses where the mine clearance is being conducted. Finally, the inability to follow advancing ground troops using sea borne logistics, may have an impact on operational maneuver and slow the operational tempo of the advancing force by limiting resupply to land routes.

It may be argued that a large opposing air force, or strong coastal defenses, could accomplish the same purpose as a mine field. However, the extent of such

defensive forces can be readily seen, and the ability to delay friendly forces can be countered using overwhelming fires. Even using massive forces no longer available today (245 Allied minesweeping vessels swept in support of the Normandy invasion),¹⁸ the task of "minesweeping is tedious...and countering mines cannot be made easy, cheap, or convenient."¹⁹

From all of these lessons learned it is easy to observe the manner in which mines may shape the maritime area of operations. Former Chief of Naval Operations, Admiral Forrest P. Sherman, said it best when describing the problems encountered with mines at Wonsan, Korea:

"...when you can't go where you want, when you want, you haven't got command of the sea. And command of the sea is a rock-bottom foundation of all our war plans."²⁰--*Admiral Forrest P. Sherman*

Mines and Operational Planning. Korea, the Falklands, and the Persian Gulf provide ready examples of how mines have impacted on the operational level of war. Mine countermeasure operations are not "sexy" in the military sense, but in the last two decades the U.S. Navy has had three ships damaged by mines, as compared to only one by enemy missile attack. Just as with logistics, if operational plans do not include sufficient emphasis on MCM forces, an otherwise well executed operation may grind to a halt. Chinnampo, during the Korean War, demonstrates how proper planning and emphasis on MCM operations can limit the operational

¹⁸ Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p.57.

¹⁹ Ibid, p.135.

²⁰ Admiral Forrest P. Sherman, as quoted in Tamara Moser Melia, "Damn The Torpedoes": A Short History of U.S. Naval Mine Countermeasures. (Washington: Naval Historical Center, 1991), p. 79.

impact and the threat to friendly forces. The following MCM decision matrix gives a conceptual model of how planning can be carried out for future operations.

MCM Decision Matrix. While not necessarily able to cover all contingencies, and not designed to discuss the tactical, the decision matrix provided in Figure 1 allows consideration of the various factors which are involved in mine countermeasures operations. Each of the major decisions will be briefly examined, and background provided where necessary.

Geography--Does the theater involve a maritime area of operations? Some isolated operations in a landlocked country may not require the consideration of mine warfare. These operations would be limited to forces capable of being transported and resupplied by air, or forces in place, with an existing supply structure.

Are there mines available in theater; either in the belligerent nation or in one of it's allies? As pointed out earlier, mines are inexpensive and plentiful, requiring few assets to place them. If intelligence for the theater can not confirm the absence of mines, the threat of mine warfare must be considered into the operational planning process.

Can offensive MCM operations be conducted? Offensive MCM operations involve attacking the enemy's mines and mine layers before the mines can be placed. This is the most efficient method of MCM operations since the mines can be eliminated as a group and do not need to be found individually once in place. Offensive MCM will most likely be the decision of the National Command Authority

(NCA) in anything other than a declared large scale war. The NCA and the operational commander would have to weigh the need to conduct offensive MCM verses the possibility of telegraphing friendly force intentions. Furthermore, as this type of MCM operation is an aggressive act inside the belligerent's territory, offensive MCM operations may precipitate an unwanted enemy response, giving the operational commander unforeseen problems.

Geography--Are there adjoining nations that will allow forward basing? Saudi Arabia, during the Persian Gulf War, is an example of using a third nation's territory to stage troops and equipment in preparation for an assault on the belligerent nation. This form of forward basing may allow the operational commander to avoid immediately dealing with any mine fields, providing the mines do not hazard other operations such as resupply.

Can the enemy Center Of Gravity (COG) be attacked solely through a land route? Again, using a third nation to forward deploy assets, and being able to attack without using amphibious assault, could alleviate the immediate need to tangle with mine fields.

Can the COG be attacked without going through the mines? If only attacking by land is not an option; is there another landing site or method of putting sufficient amphibious assault troops on the beach? Such methods could include air assault from amphibious shipping, or going where intelligence says there are no mines.

Are routes through the potential mine fields required for supply or Sea Lines Of Communications (SLOC)? Chinnampo, during the Korean Conflict, is an

example of how a landing site was required to support advancing ground operations. The need to clear paths through a mine field may be for resupply and logistics, not just amphibious assault.

Are the enemy's defenses sufficiently weak to allow for MCM operations? Since MCM forces do not possess indigenous self defense capabilities, they must either be protected, or sufficient sea and air supremacy maintained, to allow for mine clearance operations. A significant loss of MCM forces could further slow operational tempo by slowing mine clearing operations, or limit maneuver by shrinking the amphibious operating area that could be cleared in the same time period.

Are potentially heavy MCM and Amphibious force losses politically acceptable? During the Korean War, "mines caused 70 percent of all U.S. naval casualties during the first two years of that war and sank the only ships lost by the Navy in Korean waters."²¹ Execution of future MCM or amphibious operations could be required so quickly that sufficient time would not be available for the MCM force to significantly reduce the mine field risk. If the political and military leadership can not justify the gains to be made from ignoring the threat posed by mines, the decision must be made to wait until the enemy's defensive capabilities are diminished.

Finally, when MCM operations must be conducted, sufficient resources and time should be allocated to allow methodical clearing of the mine fields. History

²¹ Arnold S. Lott, Most Dangerous Sea: A History of Mine Warfare and an Account of U.S. Navy Mine Warfare Operations in World War II and Korea. (Annapolis, MD: U.S. Naval Institute, 1959), p.285.

shows that when proper planning and resources are allocated, as was the case with Chinnampo, mine clearance can work as designed, aiding the operational commander to achieve the stated goals.

From Strategic to Tactical. Mines impact all levels of war, from the strategic, to the operational, to the tactical. The operational commander may be faced with this nemesis anywhere in the world, and in any manner of operation. As more and more nations discover the ease with which they can thwart a large Navy through a low cost and plentiful weapon, the increased proliferation of mines will continue.

Sea Mines and the Operational Level of War. Mines present in the area of operations place serious limitations on the freedom with which the commander may operate. Mines shape the maritime area of operations by impacting operational maneuver, operational tempo, surprise, and security. History abounds with examples of commanders who placed insufficient emphasis on mines and mine countermeasures, and the resulting negative operational consequences. Planning for the employment of mine countermeasures forces must be an integral part of any operation, not just an after thought. A failure to plan for mines may ultimately lead to the downfall of an operation, or even more serious, the needless waste of precious lives and assets.

MCM FORCE DECISION MATRIX

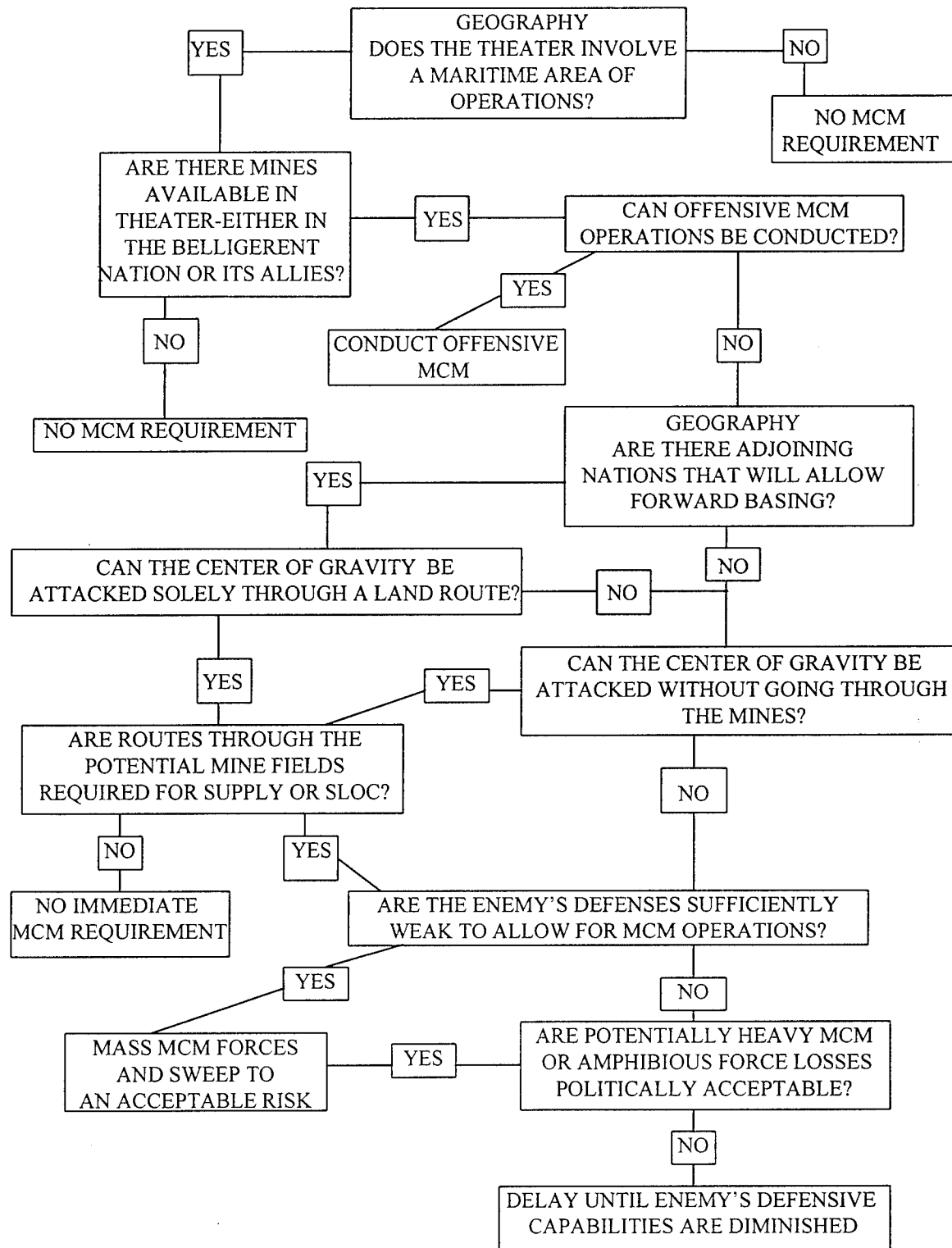


Figure 1

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